



# Harnessing AI for multimodal data analytics:

Practical applications in  
health, science, and research

Dr. Helia Mohammadi

Chief Research Technology Officer  
City of Hope National Medical Center



# Lifesaving Research Impacting Millions



We excel at rapidly translating life-changing discoveries into new treatments.

**1,300** More than 1,300 **researchers** whose main focus is cancer and diabetes.

**3** Three **GMP** (good manufacturing practice) **facilities** on our Los Angeles campus.

Home to **Translational Genomics Research Institute**, pioneering genetic tools to fight cancer.

**100M** More than 100 million worldwide benefit from our discoveries.

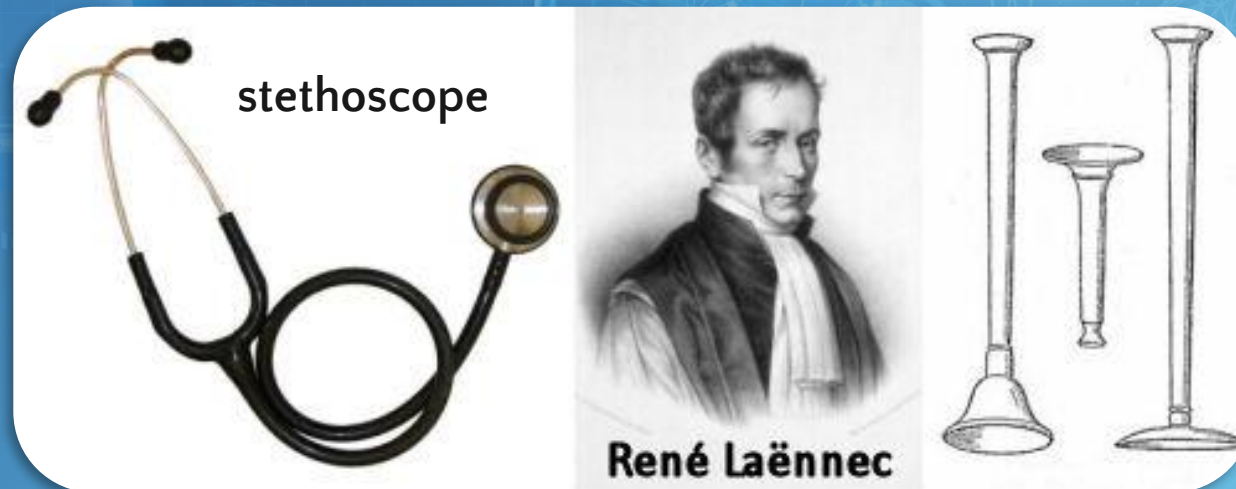
**We are the birthplace of Biotech.** First with the creation of technology that led to the development of **synthetic human insulin**, and later with monoclonal antibodies and “smart” cancer drugs like Herceptin, Rituxan, Erbitux and Avastin.

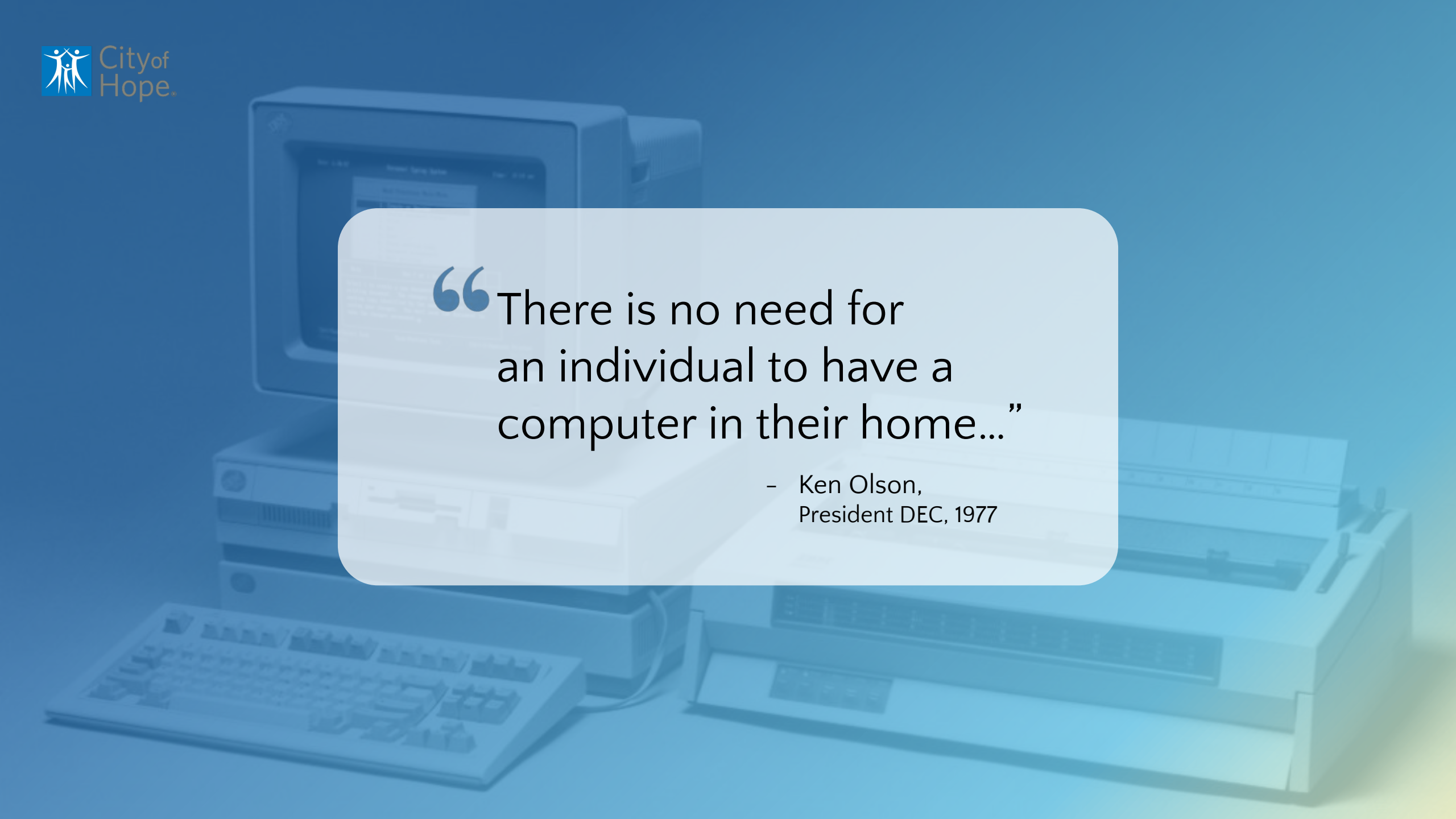
# Top Ranked in Cancer Care



Founded in 1913, City of Hope is among the top-ranked hospitals for cancer care in the U.S., recognized by U.S. News and World Report 2025-2026 rankings.

“... That it will ever come into general use, notwithstanding its value, I am extremely doubtful; because its beneficial application requires much time, and gives a good deal of trouble both to the patient and the practitioner; and because its whole hue and character is foreign, and opposed to all our habits and associations.”





“There is no need for  
an individual to have a  
computer in their home...”

- Ken Olson,  
President DEC, 1977

# The potential of AI is clear

65%

of US hospitals report using Predictive Analytics or AI-Driven Predictive Models

94%

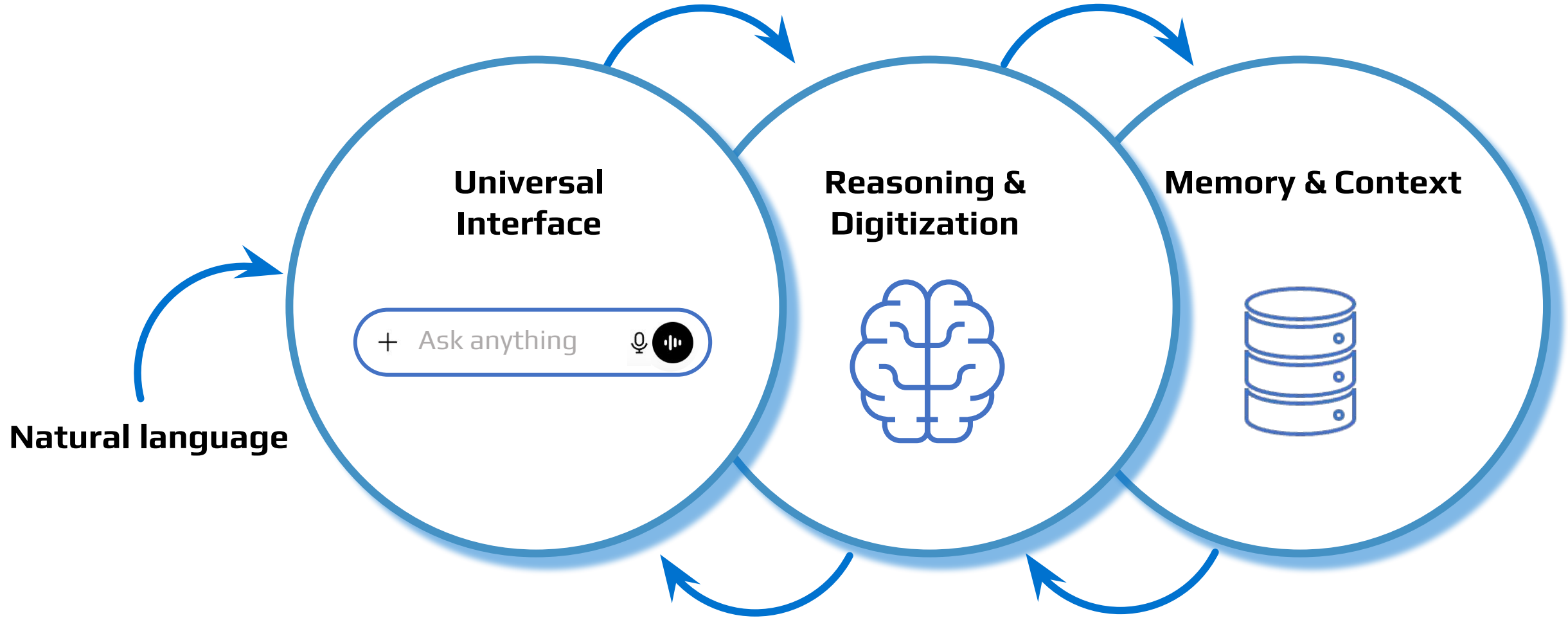
of healthcare organizations view AI as core to their operations. 86% report they are using AI extensively.

81%

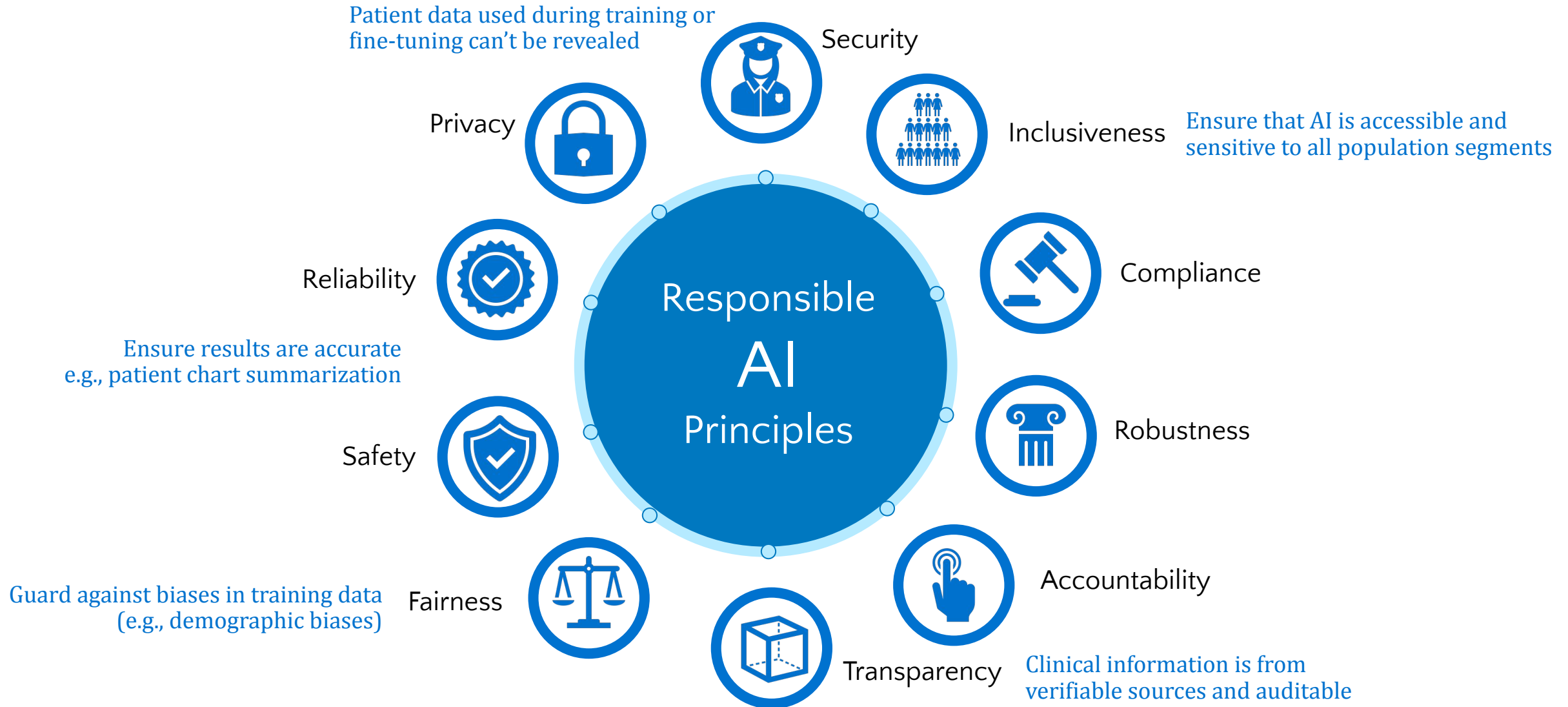
of those adopting GenAI and relating tools in 2025 reported increased revenue

73%

of organizations adopted AI, reported reduced operational costs



# Principles of Responsible AI



# Principles of Responsible AI

*Ensuring Responsible Innovation: AI Governance Framework Driving Trust, Compliance, and Strategic Impact at City of Hope.*



## AI Executive Governance Committee

Meets monthly or quarterly to oversee and prioritize high-impact, high-risk AI initiatives, ensuring alignment with strategic goals.



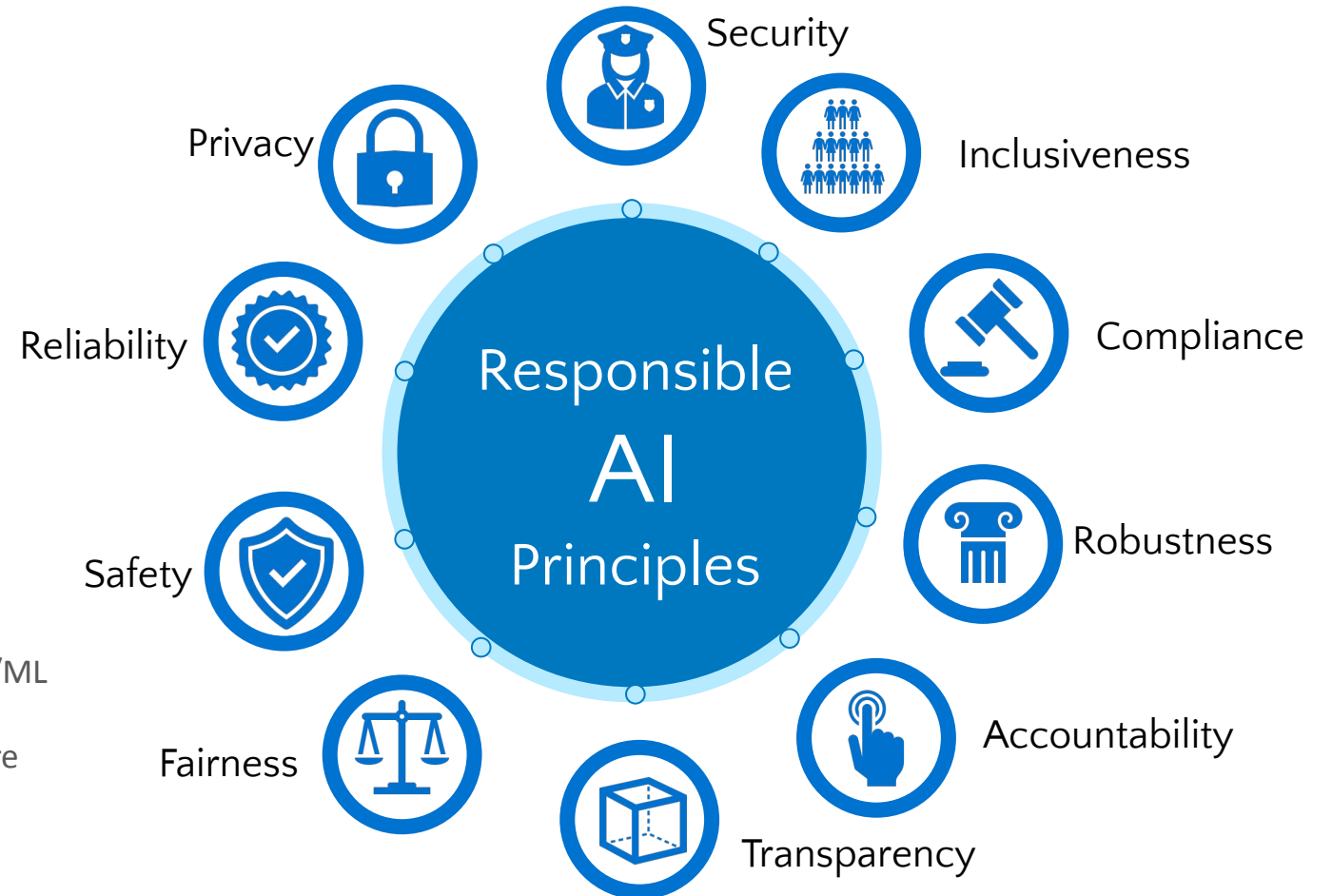
## AI Governance Workgroup

Meets bi-weekly to conduct multidisciplinary reviews of AI requests, providing insights and recommendations to the executive committee.



## Controls and Frameworks

Established comprehensive policies, including AI/ML guidelines, committee charters, risk assessment matrices, and vendor compliance forms, to ensure responsible and transparent AI use.



# Health Data & Analytics Current State

## Insights

- Can take a **long time to create**
- Often show **different answers** to the **same questions** across organizational groups
- Describe **issues/risks** that have **already happened, not what is coming**
- Frequently show a fraction of the picture (telling **“what” without the factors of producing the “what”**)
- Are often **not actionable** or **connected** to workflow
- Are typically **incremental (adding to what is not working)** as opposed to transformative
- **Do not always differentiate** between **“good to know/do”** vs. **“important to manage/act”**

## Why?

- **No central coordination** of an enterprise data and analytics strategy
- **Unarticulated needs and problems**, at an **overwhelming volume**, with **limited supply of resources**, spread over several domains
- Silos built due to this extensive demand with **lack of a coordinated and rationalized response**
- **Hype vs. Reality** – cycle time for new tech is faster, stakeholders often bypass ROI justification
- Tendency to **overlook the data work** of an effort and jump to insights
- Lack of **asset management practices** for strategic data
- Transitions from reactive to **proactive** insights is slow, not strategic

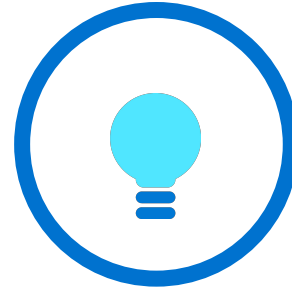
# Top Challenges in Research



Big Data  
Storage & Activate



Access to HPC on  
demand without costly  
hardware cycles

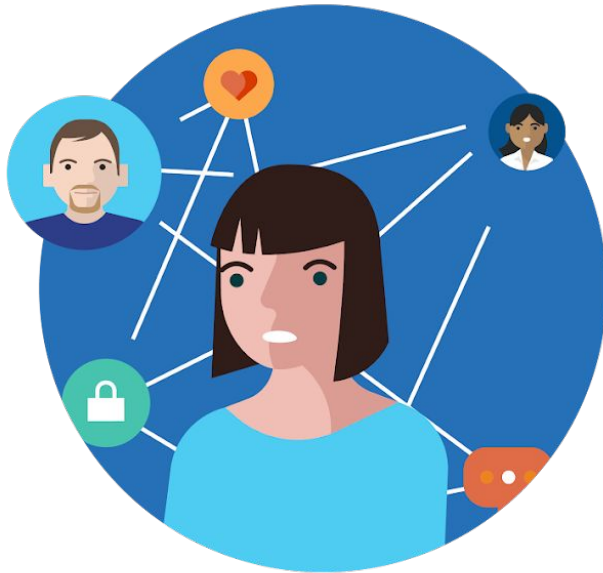


Deliver innovation  
anywhere with  
collaboration



Secure workloads  
to analyze  
sensitive data

# Research Center of Excellence Personas



**IT**  
Organization IT  
Research Lab  
Engineer/Technical Support



**Domain Experts**  
Citizen Data Scientists  
Researchers  
non-IT



**Computer & Data Scientists**  
AI Engineers  
MLOps Experts  
Algorithms Developers

# Research Center of Excellence Framework

## Onboarding



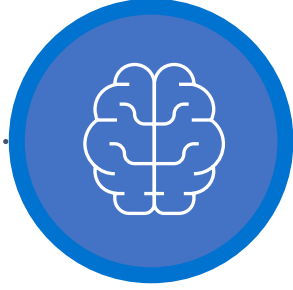
Rapidly transfer workloads & manage resource allocations. Access consent & project management tools

## Security & Governance



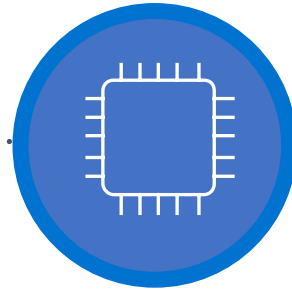
Manage identity & custom roles. Leverage multi-layered security & governance and streamline compliance

## Data, Analytics & AI platforms



Prepare & access shared datasets, no-code & low-code AI, & advanced analytics for reproducible workflows & better outcomes

## Cloud Compute



Leverage unlimited compute power. Create & share CPU & GPU clusters to scale, manage, & distribute compute

## Collaboration & Development



Increase productivity & team efficiency with secure collaborative platforms & remove development environments

## Training & Support



Access extensive training content, partner ecosystem, & best practices from secure infrastructure to responsible AI

# Research Center of Excellence Framework

- Cloud Assessment & ROI
- Workload Transfer to Cloud
- Billing, Cost Monitoring & Cost Estimation & Optimization
- Research Project Management
- Consent Management

## Security & Governance



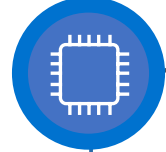
- Separate Landing Zones & Subscriptions
- Governance & Policy
- Access Control
- Identity Management
- Network Security
- Compliance
- Zero Trust Platforms

- Data De-identification
- Anomaly Detection
- Data Migration & Ingestions
- Metadata Management
- Data Storage & Data Sharing
- AI & Analytics
- R&D (Genomics & Medical Imaging)
- Public Data

## Data, Analytics & AI platforms



## Cloud Compute



- HPC
- GPU
- VMs & DSVMs
- Containers
- Quantum Computing
- Confidential Computing

- Code Sharing & Development
- Trusted Research Environment
- AppDev & Productization
- Remote Work
- Literature summary

## Collaboration & Development



## Training & Support



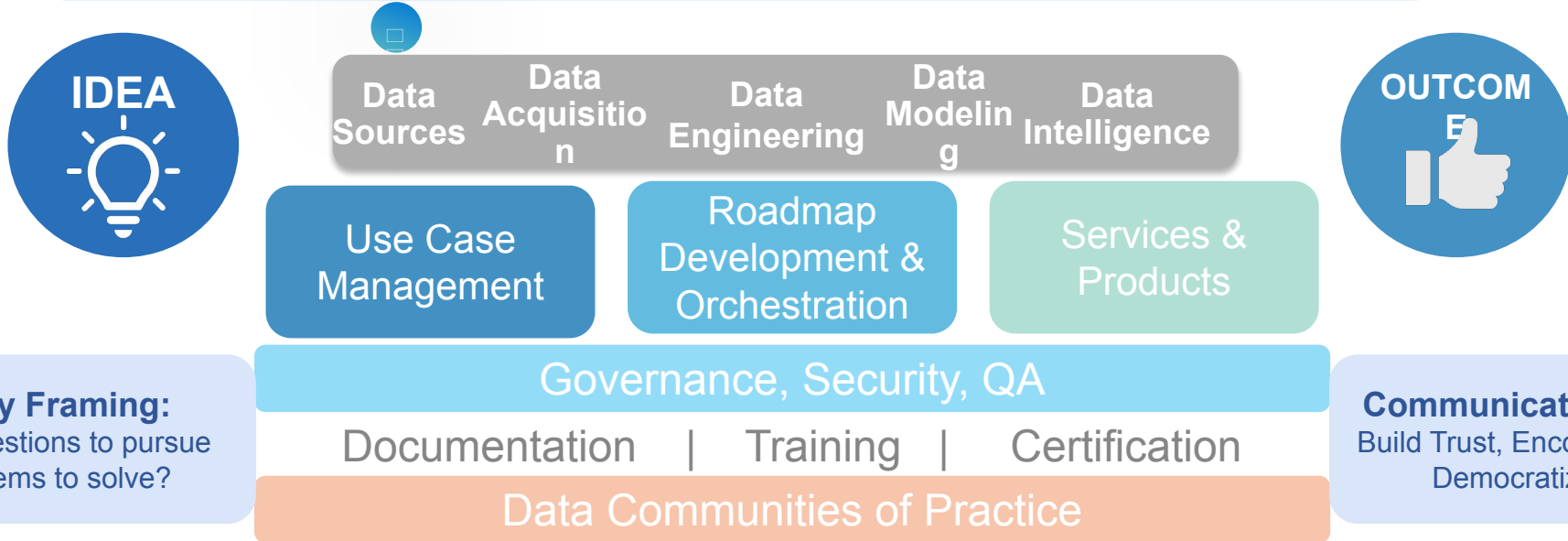
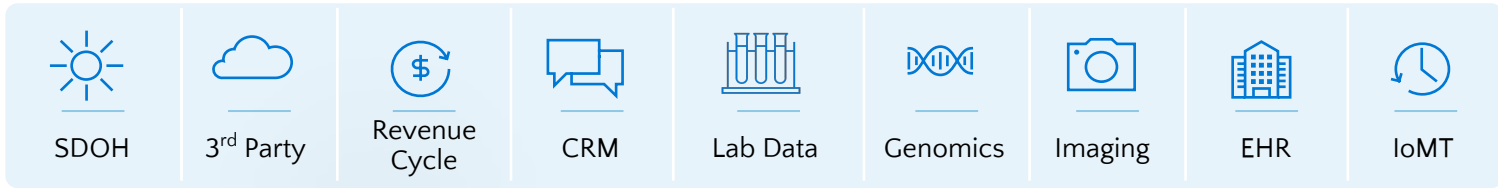
- Training
- Partner Ecosystem
- Responsible AI
- Grant & Funding Support
- Change Management

## Onboarding



# Health Data & Analytics Framework

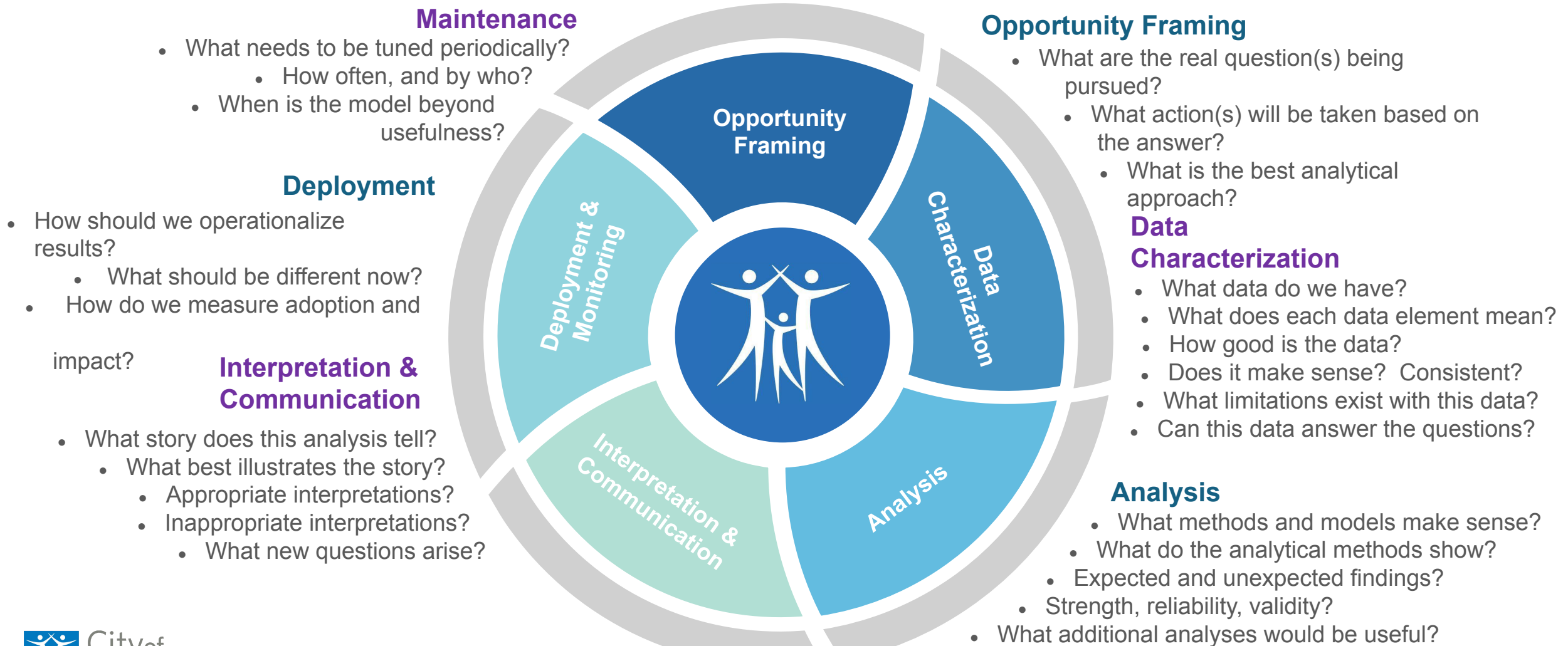
A **cloud-first** data foundation that delivers **high-quality, reusable, and trusted information** to support **faster insights** and **better intelligence**, enable **self-service** access to stakeholders.



**Opportunity Framing:**  
What are the questions to pursue and the problems to solve?

**Communication Strategy:**  
Build Trust, Encourage Adoption, Democratize Ideation

# Navigating the Analytical Life Cycle



# Harnessing AI at City of Hope

*The healthcare industry is at a pivotal moment, where Artificial Intelligence (AI) can redefine how **research is conducted, care is delivered, and operations are managed.***

- At City of Hope, our vision is to harness AI-driven insights to lead advancements in **Research, Care Delivery, Clinical Trials, Business Services, and Philanthropy**. By investing strategically, City of Hope has established itself as a market leader in healthcare innovation, delivering outcomes that are not only transformative but also scalable and sustainable.
- Our **multidisciplinary team** identifies as **problem solvers**. We are dedicated to applying machine learning (ML), artificial intelligence (AI), and other quantitative methods to keep City of Hope at the bleeding edge of technology. **We dream big, start small, fail fast, and scale even faster!**



## Problem-First, High-Impact Focus

Prioritize solving **meaningful challenges** where AI can **deliver the greatest value**, ensuring targeted, impactful applications **aligned with strategic goals**.



## Leverage Proven Technology

Capitalize on cutting-edge tools to **accelerate innovation**. Adapt existing solutions for rapid scaling and progress **without reinventing the wheel**.

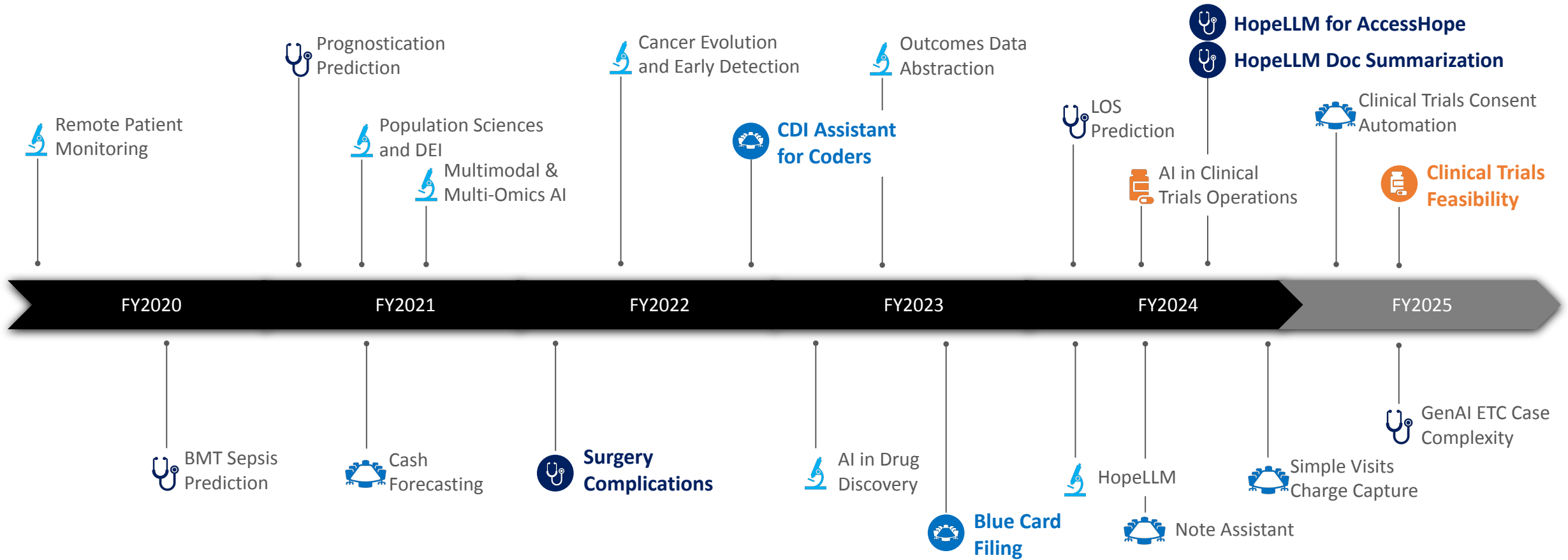


## Collaborative Expertise

Our access to world-class **clinicians and scientists** enables precise problem definition and effective AI deployment for **real-world impact**.

# City of Hope's Accomplishments

Advancing Care Delivery, Research, Clinical Trials, and Business Services through Innovation and Impact.



**Note:** The accomplishments highlighted on this slide represent key milestones and are not an exhaustive list.



Across the healthcare industry, doctors spend significant time—often during nonworking hours—reviewing patient documents to prepare for appointments. This extensive onboarding process limits the time doctors can interact with patients face-to-face.

City of Hope wanted to save time for physicians to develop a generative AI solution that could process and summarize hundreds of pages of patients' medical history documents.

With the solution, doctors at City of Hope reduced the time and burden of reviewing documents and were empowered to provide faster, more personalized patient care. The burden



“We want to take advantage of innovative technologies to support real-time decision making. We want to do it responsibly. We want to do it together. And, at the end of the day, we want to help improve healthcare for all.”

*Simon Nazarian, Chief Digital and Technology Officer, City of Hope*

#### Situation:

Doctors face a heavy administrative burden reviewing extensive medical histories—often 10–20 years' worth—for over 150,000 new patients annually, reducing time for direct patient care and increasing clinician burnout.

#### Solution:

City of Hope's AI solution—among the first in general oncology—was carefully implemented with regulatory oversight to ensure accurate patient summaries. It helps doctors quickly access comprehensive histories, saving time and allowing more focus on patient care and personal well-being.

#### Impact:

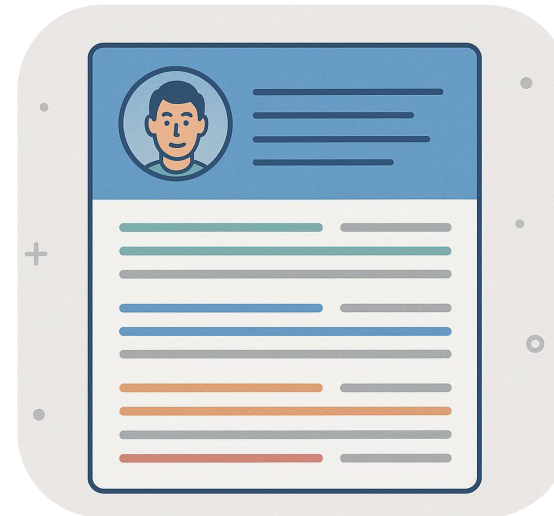
This solution boosts physician productivity and cuts costs by saving time and reducing redundant tests. Doctors can see more patients, while AI helps identify prior labs and scans. Patients also benefit, as this solution eases the burden of managing medical history.

# Clinical Trials Matching

## Trial Eligibility Criteria



## Patients Records



### BY THE NUMBERS: CLINICAL TRIALS AWARENESS

**11%** OF SITES FAIL TO ENROLL EVEN A SINGLE PATIENT

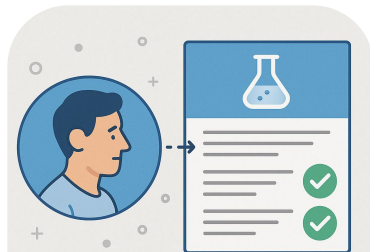
**37%** OF SITES DO NOT MEET THEIR ENROLLMENT GOALS

**40%** OF SURVEYED ADULTS DON'T UNDERSTAND CLINICAL TRIALS

**32%** OF SURVEYED ADULTS SAY THEY'D CONSIDER PARTICIPATING—AFTER THEY UNDERSTAND WHAT A CLINICAL TRIAL IS

SOURCES: TUFTS CENTER FOR THE STUDY OF DRUG DEVELOPMENT [HTTP://CSDD.TUFTS.EDU/NEWS/COMPLETE\\_STORY/%20PR\\_IR\\_JAN-FEB\\_2013](http://csdd.tufts.edu/news/complete_story/%20PR_IR_JAN-FEB_2013)  
JOURNAL OF CLINICAL ONCOLOGY [HTTP://JCO.ASCOPUBS.ORG/CONTENT/21/5/830.SHORT](http://jco.ascopubs.org/content/21/5/830.SHORT)

### End to end clinical trials matching

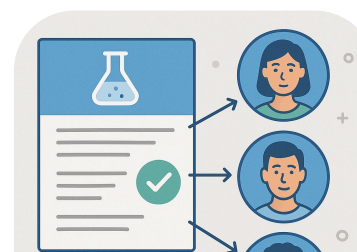


**CLINICAL TRIAL  
MATCHING**

**Automated criteria screening**  
in use by clinical trials office

**Automated consent and  
reconsent candidate  
identification**  
in use by clinical trials office

### Clinical trial to patient matching



**PATIENT  
RECRUITING**

# Key Areas of AI Impact

*Realizing breakthroughs through application of cutting-edge AI advancements across key domains.*



## Early Detection and Prevention

Harness AI to **predict and prevent diseases before they progress**, enhancing early intervention efforts.

- Predicting Disease Trajectory
- Predictive Risk Modeling
- Automated Screening



## Enhanced Diagnosis and Decision Support

Leverage AI tools to improve diagnostic accuracy and empower clinicians with **real-time decision-making support**.

- Implementation of Commercial Tools
- Development of Strategic Tools



## Precision Medicine

Apply AI to deliver **personalized healthcare**, enhancing treatment effectiveness and patient outcomes.

- Personalized Treatment Plans
- Enhanced Outcome Prediction



## Patient Access

Expand **equitable access** to care by applying AI to identify and mitigate biases while **improving patient engagement in underserved populations**.

- Targeted Outreach
- Bias Detection and Mitigation
- Clinical Trials Optimization
- Remote Monitoring
- Advancing Populations Sciences
- Analyzing Social Determinants of Health (SDOH)



## Accelerated Drug Discovery

Revolutionize drug development by using AI to **expedite research and design more effective treatments**.

- Rapid Candidate Screening
- Optimized Molecule Design



## Patient and Provider Experience

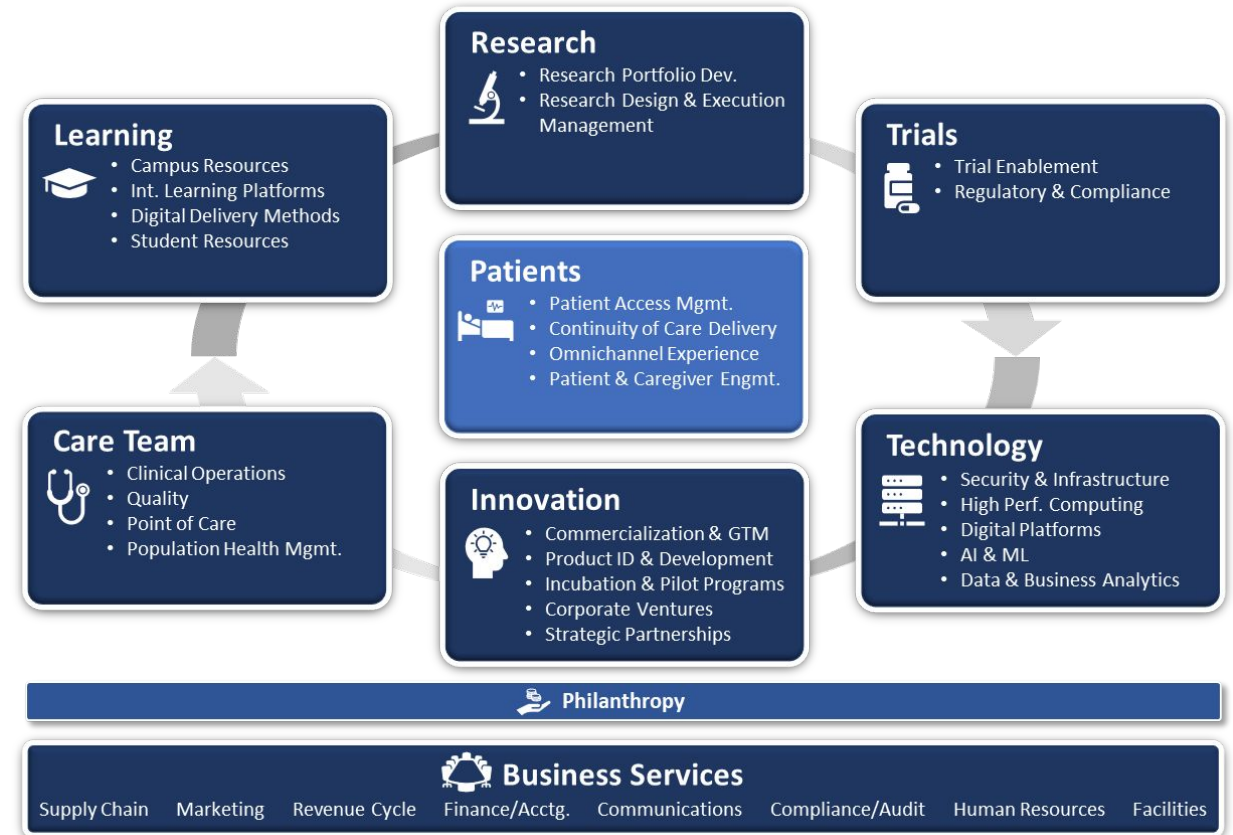
Enhance care delivery by empowering providers and engaging patients through **AI-driven personalization and operational efficiencies**.

- Enhanced Patient Engagement
- Provider Empowerment and Time-Saving

# Take Away

*The healthcare industry is at a pivotal moment, where Artificial Intelligence (AI) can redefine how **research is conducted**, **care is delivered**, and **operations are managed**.*

- AI is transforming oncology care and research through **cross-functional collaboration**.
- The importance of **measured impact** with AI cannot be overstated.
- With **proper governance, strategic investment, and commitment**, we will pioneer the future of cancer research and care—turning innovation into real-world outcomes.





# Thank You

✉ [heliam@coh.org](mailto:heliam@coh.org)

**in** [in/heliam](https://www.linkedin.com/company/city-of-hope)



**Helia Mohammadi, Ph.D.**  
Chief Research Technology Officer  
City of Hope

